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ABSTRACT

In spite of the brief duration of the Mastery Learning Program at Durham College, this final report on the activities and outcomes of the project reveals several positive effects upon students and faculty. The report begins by providing background data on the college, an independent junior college serving a population of economically disadvantaged minority men and women from rural areas in North and South Carolina and Virginia. It then discusses the outcomes expected during the program's first year of implementation, which included the development of complete sets of learning materials based on Bloom's Mastery Teaching Strategy for eight courses, their use for one quarter, and their evaluation. Next, the activities are described that were carried out to accomplish the objectives and the results of a comparison of the academic achievement of students taught by mastery and conventional approaches are provided. Program objectives and activities are presented as they were planned for the second year of the project, and the actual accomplishments of the prematurely curtailed program are described. After a discussion of the overall achievements and shortcomings of the program, the report addresses the issue of the dissemination of documents and information about the program and reviews the program's budgets and funding. A report evaluating the program's first year is appended. (AYC)

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FINAL REPORT

THE MASTERY LEARNING PROGRAM AT DURHAM COLLEGE

Durham College
3128 Fayetteville Street
Durham, North Carolina 27707

Grant No: G007804543
Starting Date: September 1, 1978
Ending Date: December 31, 1979
Number of Months: Sixteen

Project Director:
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540 Nottingham Drive
Fayetteville, N.C. 28301
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Grant Award:
Year 1 $38,697
Year 2 $33,998

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Executive Summary

The administration and faculty of Durham College decided in 1977 that the traditional learning strategy was inappropriate for the special needs of its disadvantaged students. The College has traditionally served a population of minority men and women who are predominantly from rural, low income families in North Carolina, South Carolina, and Virginia. The combined SAT scores over the past five years have averaged around 580 out of a maximum of 1600. In an attempt to better meet the needs of its students, the staff of Durham College initiated the Mastery Learning Program in 1978 after being granted funds for that purpose over a three-year period involving $103,000.

Dr. Emmett Jones of the City Colleges of Chicago, who was appointed consultant for the Program, made ten visits to the campus over the 16 month duration of the project; he oriented the faculty with respect to Mastery techniques and the development of Mastery materials, monitored their progress on the development of these materials and their use of them in the classroom, and evaluated the effectiveness of the Program at the end of the first year. In the course of the Program eight full-time faculty developed ten sets of materials, each containing behavioral objectives for the course and each of its units, unit formative tests and their parallels, and two summative exams. Six faculty applied the materials in classroom instruction and at the same time instructed a Control class in the same course using traditional methods. Dr. Jones' evaluation at the end of the first year indicated that there had been an overall improvement in instruction at Durham College; there were obvious changes in the attitudes of instructors and the students who were instructed in the Mastery classes. Repeated successes on the diagnostic-progress tests (formative tests) appeared to have significantly increased students' academic self-concepts and enthusiasm for learning. Seventy-eight percent of the Mastery students achieved final grades of "A-B" as compared with 75 percent of the Control students. It is important to note that the small Control classes allowed for a great deal of individualized instruction; therefore, the cognitive achievement seen there would be very difficult to improve upon, even using tutors on a one-to-one student-teacher relationship.

It is important to keep in mind that the results represented the first attempt at implementation of the Mastery Learning strategy on the part of the faculty at Durham College. Dr. Jones indicated that the Mastery experience at the City Colleges of Chicago demonstrated that more experienced instructors produce better results than do those who are using the strategy for the first time.

At the beginning of instruction in the second year of the Program, five of the six Mastery faculty administered a pre-test which was designed to record the level of academic self-confidence and motivation among students in the Mastery and Control sections. If the Program had continued through January 1980, the same faculty would have administered the same test at the end of instruction to detect any changes in self-confidence and motivation. These tests would have provided a basis for comparing affective changes among students in the Mastery and Control sections of the same course.

In spite of the brief duration of the Program (16 months), the positive effects upon students and faculty were obvious although not manifested definitively in the empirical data. Both the Director and the consultant felt that if the Program had run its course for three years, the contrast in student performance between the Mastery

and Control sections would have manifest itself dramatically in the data.

The project at Durham College became known and well-received through a statewide workshop by educators within the Community College System.

The brief effort to implement a campus-wide faculty and instructional development program at Durham College, known as the Mastery Learning Program, deserves full consideration by educators on all levels in North Carolina and the nation. Such a program can be replicated with reasonable effort and relatively little funding in secondary, junior, or senior institutions where the administration has the courage to change attitudes and serve underdeveloped humans according to a manner in which they can learn.

Because of the project's short duration, the documents produced are relatively few: initial proposal, six-months' report, 1979, consultant's evaluation, 1979, end-of-year report, 1979, this final report, and the Mastery course materials. Because of the closing of the College, dissemination from the College may be difficult. Requests for information or copies of materials should be addressed to the Director, Dr. Donald R. Wire, or to the President, Dr. J.W. Hill. Those requesting copies should be prepared to pay the cost of reproduction and postage. Following are the addresses of Dr. Wire and Dr. Hill: Dr. Donald R. Wire, 540 Nottingham Drive, Fayetteville, North Carolina, 28301, 919 488-6624; Dr. J.W. Hill, Durham College, 3128 Fayetteville Street, Durham, North Carolina, 27707, 919 688-8813.

The Director feels that the proposal, the end-of-year evaluation and report, 1979, and this report are of value to junior and senior college administrators who are reviewing alternative learning strategies for adoption at institutions which serve disadvantaged learners. These documents together with the raw data sheets from the Mastery and Control sections should be of interest to educational researchers. Faculty members at secondary, junior, and senior institutions would be interested in examining copies of select course materials and the related performance data sheets. The Director believes that the expanding awareness of educators with respect to learning strategies for the disadvantaged will manifest an increasing demand for such materials in the future.

Description of Mastery Learning Project

Durham College is an historically black, independent junior college which is located in Durham, North Carolina. The College has traditionally served a population of disadvantaged minority men and women who are predominantly from rural, low income families in North Carolina, South Carolina, and Virginia. A large majority of these students, usually about 70 percent, rank in the lower quarter of their high school graduating classes. Most are the products of small under-financed high schools where the total educational process has been inadequate in providing the basic skills necessary for successful postsecondary acievement.

Each fall, the College faces a new wave of entering freshmen who bring with them special problems. Data relative to the reading, computative, and writing skills of the high school seniors show that over 70 percent of these students perform below the ninth grade norms in basic skills, and 50 percent of the 70 percent perform below the seventh grade norms in reading, writing, and arithmetic. Accompanying these academic weaknesses which are obvious in the students is a sense of futility and despair in their approach to the learning process. Academic failure has bred a sense of futility in further attempts at learning. This affective problem is as great as any cognitive one which the College faces in administering to the special needs of its students.

During the academic year, 1976-1977, the administration and faculty of Durham College reviewed its mission as a postsecondary institution and reassessed the effectiveness of its approach to achieving that mission. As a result, the College faculty focused on the special needs of its students and decided that the traditional learning strategy in use was inappropriate to the acievement of its mission.

After carefully studying the problem and reviewing alternative strategies, the administration decided to seek funds for the implementation of a Mastery Learning Strategy. Earlier in the same year, two instructors had experimented in their English classes with the Bloom strategy which had been introduced to the faculty by Dr. Emmett Jones, co-author of Mastery Learning: A Strategy for Academic Success in a Community College, and Director of the Mastery Learning Program in the City Colleges of Chicago. During the academic year, 1977-1978, a comprehensive instructional improvement proposal was submitted to FIPSE. That proposal was funded for approximately $103,000 over a three-year period.

Durham College began implementation of the Bloom Strategy on September 1, 1978. Dr. Donald R. Wire, Academic Dean of Durham College, was appointed Program Director and Dr. Emmett Jones of the City Colleges of Chicago was selected as the program consultant.

This report is an account of the activities and outcomes of the first year, September 1, 1978-August 31, 1979, and of the first half of the second year, September 1, 1979-December 31, 1979, of the Mastery Learning Program at Durham College. Because of the loss of accreditation and the subsequent loss of crucial funding, Durham College was compelled to cease instruction as of December 31, 1979. The employment of the Project Director was terminated on that date.

Outcomes Which Were Expected During the First Year

1. Eight full-time faculty members will have developed complete sets of Mastery

materials for eight courses and will have become knowledgeable in the application of the Bloom Strategy in the classroom.

2. The eight faculty will have applied these materials and the Bloom Strategy in the classroom during the period of at least one academic term.

3. The eight faculty will have maintained records on the performance of their students under the Mastery Strategy during the course of the term.

4. Five faculty will have spent a period of about two weeks in professional association with experienced Mastery faculty of the City Colleges of Chicago.

Activities Carried Out to Produce the Expected Outcomes

Dr. Emmett Jones, the program consultant, first came to the campus in October of 1978 for the purpose of planning the specific activities for the first year and for anticipating those for the second and third years. As a result of the initial planning session, Dr. Jones was scheduled to return to the campus in December of 1978, to conduct a day-long orientation of the faculty and staff on the concepts and techniques of the Bloom strategy. All full-time faculty and several administrators participated. Dr. Jones handed out numerous materials and instructed the faculty on how they would proceed in the development of course materials for the one course which each had selected. He set specific objectives to be achieved by each faculty member before the time of his next visit in January 1979. Dr. Wire, the Program Director, monitored the progress of the faculty in these activities and provided assistance and support.

When Dr. Jones returned in January, he found that considerable progress had been made. He and the Program Director evaluated the work of each of the seven full-time faculty and one administrator who were developing the Mastery course materials. After the first evaluation, Dr. Wire decided that all evaluations, henceforth, would be documented in written form. Participants were to receive monthly incentive checks on the condition that they had achieved the specific objectives set at the time of the previous consultation session.

Dr. Jones came for the third consultation session in early February, 1979. He found that good progress had been made and documented such on the evaluation forms. He indicated that all eight participants should be able to complete their first sets of Mastery materials before his next scheduled visit at the end of February 1979. When he returned at that time, he found that all of the participants had completed their course materials. During that visit, Dr. Jones fully prepared each faculty member for the immediate application of their materials in the classroom.

During the spring quarter 1979, seven faculty applied their Mastery materials and the Bloom strategy in their respective classes. One instructor, who had two sections of the Fundamentals of English, was able to use one of these as a control class for evaluation purposes. The other six instructors recorded performance data from the most recent class which they had instructed in the same course for the purpose of providing control data for evaluation; this technique for evaluation was recommended by the program consultant. Dr. Jones returned to the campus three times during the spring quarter 1979 for the purpose of faculty guidance and program evaluation. During May 1979, six faculty were developing new materials as well as applying those previously developed. During his final visit at the end of the quarter in May 1979, Dr. Jones compiled and analyzed all of the performance data and completed the program evaluation for the first year of the Mastery Learning Program at Durham College.

The Achievement of Expected Outcomes

The outcomes which were expected during the first year of the Mastery Learning Program at Durham College have been outlined above. The first expected outcome was achieved in that eight faculty members completed sets of Mastery materials for eight courses and became knowledgeable in the application of the Bloom strategy in the classroom. The evaluation sheets for February 1979 document this fact. The second expected outcome was largely achieved in that seven faculty applied Mastery materials and the Bloom strategy in the classroom during the period of the spring quarter 1979. With reference to the third expected outcome, seven faculty maintained records on the performance of their students under the Mastery strategy. The fourth expected outcome was not achieved because the Chicago trip could be scheduled only at a time during the summer when conflicts developed for the Mastery faculty who were scheduled to attend. The Mastery faculty were not employed during the summer because of limited enrollment.

Program Evaluation of the First Year

Dr. Jones conducted an evaluation of the Mastery Learning Program at Durham College on May 24 and 25, 1979. He interviewed and collected performance data from each of the seven Mastery faculty members. After compiling and analyzing the data, Dr. Jones presented and discussed his findings in a report which is contained in the appendix of this report.

It should be kept in mind that the intent of the Mastery Learning Program at Durham College was not to prove the effectiveness of the Bloom strategy per se; considerable research had already demonstrated this effectiveness. The strategy was selected in the first place because of this. Dr. Wire and Dr. Jones felt that one of the most suitable ways to evaluate the effectiveness of the program at Durham College would be to compare student performance in the Mastery and Control classes. It was also felt that the subjective observation of the Mastery faculty would constitute another legitimate measure of the effectiveness of the program at Durham College. Both techniques, therefore, were employed in the evaluation process.

Data is first presented here for 99 students who took the initial formative Test #1 in their respective courses; following that is the data for the 44 students who failed to achieve Mastery on the first test and therefore took the parallel Re-Take #1 after doing corrective work.

FORMATIVE TEST #1

		A	B	C	D	F
Number	99	30	22	19	14	14
Percent	100	30	22	19	14	14

RE-TAKE TEST #1

		A	B	C	D	F
Number	44	10	10	11	2	11
Percent	100	23	23	25	4	25

The above data shows that 28 students scored in the "D-F" category on the initial test on the materials covered in Unit One. On the re-take test, following corrections, only 13 students demonstrated the same deficiencies. The above data also shows that 52 percent of the students scored in the "A-B" category on the initial test on the materials covered in Unit One. After the re-take, the percent rose to 72. That is 72 percent of all students enrolled in Mastery Learning classes finally achieved mastery on materials covered in Unit One.

The set of data presented below is a summary of final grades earned by students in the Mastery and Control classes at the end of the spring quarter 1979. In each instance, the Control class was taught by the same instructor, had the same objectives, and used the same text as the Mastery class; however, all of the Control classes except one were taught during quarters previous to the Mastery classes.

The data shows the results which were produced during the spring quarter 1979 in the disciplines cited. Although the data does not demonstrate marked superiority in the effectiveness in the Mastery Learning strategy over the traditional strategy in the seven academic areas cited, Dr. Jones' assessment indicated that there had been an overall improvement in instruction within Durham College during the first year of the program. The small enrollment in the classes made it difficult to attach statistical significance to the data. Even so, 78 percent of the Mastery students achieved final grades of "A-B" as compared with 75 percent of the Control students. It is also important to note that the small Control classes allowed for a great deal of individualized instruction; therefore, the cognitive achievement seen there would be very difficult to improve upon, even using tutors on a one-to-one student-teacher relationship.

It is important to keep in mind that the results represented the first attempt at implementing the Mastery Learning strategy on the part of the faculty at Durham College. Dr. Jones indicated that the Mastery experience at the City Colleges of Chicago demonstrated that more experienced instructors produce better results than do those who are using the strategy for the first time.

A large majority of the Mastery faculty at Durham College reported an increased enthusiasm for learning on the part of their Mastery students. Repeated successes on the diagnostic-progress tests seemed to have significantly increased a student's academic self-concept with regard to general school ability. Also according to the written and oral observations presented by the faculty, the students seemed to have become more interested in studying and learning specific subjects.

According to the observations of Dr. Jones and Dr. Wire, the experience with the Mastery Learning strategy also produced changes in instructor behavior and attitudes. Instructors no longer thought of their function as singling out and certifying qualified students. Most have moved to the view that the teacher's role is to facilitate learning for all, thereby minimizing disparity in student cognitive achievement.

	MASTERY						CONTROL					
	(N)	A	B	C	D	F	(N)	A	B	C	D	F
Business Law	(4)	2	2	0	0	0	(12)	7	3	2	0	0
Psychology	(31)	16	10	3	1	1	(26)	10	12	3	0	1
Shorthand	(3)	1	1	0	1	0	(9)	3	4	2	0	0
Fashion Buying	(8)	5	2	1	0	0						
English Fundamentals	(18)	4	7	5	0	2	(11)	5	2	3	1	0
Business Mathematics	(20)	10	5	4	1	0	(20)	7	5	8	0	0
Records Management	(1)	1	0	0	0	0	(2)	1	1	0	0	0
Total	(85)	39	27	13	3	3	(80)	33	27	18	1	1
Percent		46	32	15	3.5	3.5		41	34	23	1	1

Those students who experienced success with the Mastery strategy asked for more classes using that approach.

Dr. Jones concluded in his report that the extended use of the Mastery strategy within Durham College would continue to cause overall improvement in instruction and that as the class sizes increased, this improvement would become more manifest statistically. Results from the summer, 1979 are contained in the appendix.

Outcomes Which Were Expected During the Second Year

The Mastery Learning Program was in its second year at Durham College when financial difficulties compelled the College to close its doors. The following are the outcomes which were expected during the second year and those toward which the staff labored during the last four months prior to closing.

1. Eight faculty members will have developed ten additional sets of Mastery materials for use in the classroom. This will mean that since the beginning of the program in September 1978, ten sets of materials will have been produced and 11 of these will have been applied by eight faculty in the classroom.

2. The student performance records maintained by the faculty will demonstrate that performance in the Mastery classes is superior to that in the Control classes.

3. The results of the affective tests in the Mastery and Control classes will indicate greater improvement in academic self-confidence and motivation in the Mastery classes than in the Control classes.

Activities Which Were To Be Carried Out To Produce The Expected Outcomes

In the faculty workshops during the first week in September 1979, the Mastery faculty, numbering six, continued work on their second sets of Mastery materials. Dr. Wire assigned the faculty to the Mastery and Control classes for the fall semester. Each member's teaching load was divided equally between the Mastery and Control classes; for example, a faculty member teaching four sections of English Fundamentals would instruct two of these according to the Mastery strategy and the other two according to traditional techniques. In addition, Dr. Wire prepared the faculty to administer the pre-test which would measure the affective traits of each learner, i.e. self-confidence and motivation; this instrument was designed by the graduate students of Benjamin Bloom, the developer of the strategy.

Five faculty members administered the pre-test to their students during the first or second class meeting of the fall semester 1979. They would have administered a similar post-test at the end of the semester in January had the program continued. An analysis of pre-test and post-test scores would have indicated any changes in self-confidence and motivation among students in both sets of classes; this technique would have demonstrated whether or not the third expected outcome of the second year had been produced.

Dr. Jones came to the campus at the end of the second week of classes, fall semester 1979, for the purpose of orienting the one new full-time faculty member and to review the individual progress of the six faculty already developing new materials and applying their completed materials in the classroom. On the evaluation sheets, he rated the progress as excellent.

Dr. Jones was scheduled to return to the campus at the end of November 1979 to review the second set of completed materials and to orient two faculty members who had not previously participated in the program. By the end of November 1979, the number of completed sets of Mastery materials was expected to be 13, and the number of faculty who had been involved in development or application was expected to be eight. By the end of the academic year in May 1980, Dr. Wire expected that eighteen sets of materials would have been developed and that 11 of these would have been applied in the classroom by a total of eight Mastery instructors.

Although these events did not come to pass, the Director still believes it significant to indicate what would have happened. At the time that the spring semester was to begin in February 1980, the Mastery faculty would have pre-tested their students and then utilized their new materials, along with those previously developed for instruction in their scheduled courses. Dr. Jones would have returned to the campus at the end of February to review progress in materials development and student performance. He would not have returned then until the end of May 1980, at which time he would have approved completed materials, compiled and analyzed performance data, and completed the end-of-year evaluation for the second year of the program. Dr. Jones' analysis of student performance would have indicated whether or not the second expected outcome of the second year had been produced.

Between Dr. Jones' visits, Dr. Wire would have visited classrooms, set monthly objectives, monitored activities, and evaluated progress. He would have seen to it that the two sets of classes were being conducted in a way that would have made possible and facilitated a meaningful statistical comparison and analysis of performance data.

The Achievement of Expected Outcomes (First Four Months of the Second Year)

As a result of the freezing of project funds early in December 1979, the achievement of the Program's expected outcomes was hampered; however, the Director and staff persevered to carry on with their activities and accomplish as much as possible. Two faculty members did complete two additional sets of materials in the wake of the breakdown of the support services and with the absence of incentive funds. This brought the total of completed Mastery course packages to ten prior to the termination of the program. The Director considered the ten to be in a form suitable for dissemination. Eight of the ten had been applied by the faculty for classroom instruction prior to the termination of the Program in December 1979.

Because of the untimely end of the Program before the final summative exams which were scheduled for January, the faculty was not able to evaluate their Mastery and Control students according to the prescribed methods. Likewise the post-tests which were scheduled to be given in January to measure changes in affective traits (academic self-confidence and motivation) were not given. As a result, it was impossible to compare the academic performance and affective changes among students in the Mastery and Control sections. Consequently, there is no reliable empirical evidence for evaluating the effects of the Program's last four months. Only the Director's subjective evaluation is available for an assessment of the outcome of the last four months. The objective of producing 18 sets of materials and utilizing 11 of these by the end of the year was not achieved. The Director was convinced from his own observations of six Mastery and six Control sections that the performance and attitudes of the students in the Mastery sections were superior to those of the students in the Control sections. During the months of October and November 1979, the Director visited Mastery and Control sections instructed by the same instructor, observed instructional techniques and student performance, and studied formative test results. He evaluated each instructor's performance and discussed it with each instructor. It was apparent that an increasing number of

Mastery students were achieving mastery on the initial formative test. The students were definitely eager to earn the coveted Mastery Certificate. It was apparent to the Director that the Mastery strategy was producing positive changes among students in attitude and performance.

The Director does have on file the results of the pre-test given in September 1979 by five faculty members to their Mastery and Control sections.

The project involved no major changes from the original proposal except that the actual classroom application of the materials began during the spring quarter 1979 rather than in the fall of 1979 as originally planned.

A discussion of the actual expenses of the Mastery Program during the 16 months will be presented at the conclusion of this report.

The Results of the Mastery Learning Program and Reflections on Its Overall Achievements and Shortcomings, September 1, 1978-December 31, 1979

In spite of the untimely demise of the College and the Program because of financial difficulties, the Program, during its 16 months, did effect substantial changes in the behavior of the faculty and students of Durham College. The Program can best be viewed as a faculty and instructional development program which was implemented to improve the performance and attitudes of the disadvantaged, minority students at Durham College. The administrative staff of the College were totally committed to the success of the Program from its outset to its termination.

Members of the administrative staff, like Donald W. Ward, the author of the original proposal, looked upon Mastery Learning as a far reaching innovative program in the development of instructional materials and techniques. The staff became aware that the Mastery strategy of Benjamin Bloom had been implemented on all levels of education and in many regions of the world and that the empirical data of Dr. Bloom and his associates provided substantial evidence in favor of its effectiveness. The experiences of Dr. Emmett Jones and his colleagues within the City Colleges of Chicago over the past ten years provided the heritage and inspiration for a similar program at Durham College. There was no previous record of its implementation on any level in North Carolina despite its success in institutions in other parts of the nation and the world. The administrative staff of the College, therefore, saw its mission and responsibility as broader than the immediate one of administering the benefits of the strategy directly to its own students; that it should share its techniques, materials, and results with other schools or systems in North Carolina and the nation was an intent central to the development of the initial proposal and one that acquired increasing emphasis as the program evolved. The entire staff grew increasingly excited about and proud of this aspect of its mission.

Up to this point in the summary discussion the Director has referred largely to the administrative staff in discussing the early conception of the program and the early staff commitment to its goals. This is appropriate to give an accurate account of the implementation or evaluation of the program at Durham College. At the outset the teaching staff was not convinced that such a program was feasible for Durham College. They did not hesitate to express their reluctance to embark upon something which appeared to be a radical departure from what they had been doing for 15 to 20 years in some cases. Many viewed it as just another experiment in which

they were compelled to participate. Many were skeptical of the theory and the strategy, even before it was thoroughly explained. Most were reluctant to become involved in something that would demand more effort in class and more of their time outside of class.

The initial proposal made it clear that the entire staff of Durham College would be committed to and participate in the Mastery Learning Program. The President, Dr. J.W. Hill, in a letter, committed himself and his institution to the implementation of the strategy. Without this commitment, it is indeed unlikely that the funding would have been forthcoming. This was fitting and proper, and its achievement became the prime task of the Director. Without the total commitment and backing of the President, the Director could not hope to be effective. The Director feels that it was appropriate that as Academic Dean he was appointed Director; the Director must be in a position in which he works intimately with the faculty and can exert professional and economic pressure on them to secure maximum cooperation.

The Director's first responsibility was that of making the final decision on the consultant for the program; the second was that of inviting him to the campus for an initial planning session. The Director invited about four staff members including faculty to meet with Dr. Jones for the planning session. That session which lasted about four hours involved a brief orientation to the Mastery strategy and the development of a schedule of visits for the academic year. The Director is convinced that it is a definite "must" to have a consultant for the program; it would be very difficult to put the theory into practice without one.

The consultant came to the campus for the second time for the purpose of conducting a one-day orientation session for the faculty and staff; attendance by all full-time faculty was mandatory, and all instruction was suspended for the day. A number of administrators attended as well. Dr. Jones brought prepared materials, and the Director had reproduced other hand-outs which Dr. Jones had given him at the planning session. Dr. Jones explained the theory and the practice of Mastery Learning to the staff and then answered questions. The Director believed that the session should be very informal so that the faculty would feel free to voice their skepticism and probe into the details. They did just that, and the consultant used their questions and doubts in a positive way to change their attitudes. After all, that was the purpose of the Program: to change the thinking and attitudes of a faculty attuned to traditional methods. The day-long orientation did not erase all doubts and inspire total commitment, but it began the process. Dr. Jones concluded the day by giving the faculty a list of the items included in the course packages which he indicated he would review for each faculty member at the time of his next visit. The Director was convinced from the start that it was absolutely necessary that a clear list of reasonable tasks be given to the faculty for accomplishment before each subsequent visit.

A short time after the orientation session, the Director announced at a faculty meeting that incentives would be earned by those faculty members who completed their tasks on time; specific tasks were set for the period between visits and for each month so that faculty motivation would be continuous. The initial incentive was set at $32 per month and was later increased to $40 for the second year of the Program. The Director and the consultant felt that some monetary incentive was desirable for inspiring the kind of continuous cooperation needed for success. Experience underlined the importance of the incentive. The Director feels that the portion of the budget devoted to incentives was very cost-effective and necessary

for maximum output on the part of an already heavily burdened faculty.

The Director told the faculty that their receipt of a separate incentive check each month would be dependent upon a favorable evaluation by Dr. Jones and himself in terms of the accomplishment of assigned tasks. The Director encountered the first problem in the process after the first incentive checks were issued; a faculty member who had not cooperated and who had not received an incentive was very upset. In the absence of a written evaluation by himself and Dr. Jones, the Director could not immediately substantiate Dr. Jones' evaluation. Out of this conflict, the Director realized the need to develop an evaluation form to be completed and signed by himself and Dr. Jones after each consultation. With the use of this documentation no other problem developed in the evaluation and incentive process. Not every faculty member earned an incentive each month, and each received in advance the evaluation for the month's work according to the pre-established criteria. As the Program progressed, the Director felt that the system of faculty evaluation and incentives was very effective.

During the times between the visits of the consultant, the Director monitored the progress of each faculty member on the materials which would make up the course package on which he or she was working. Each package consisted of: student orientation statement, course objectives (behavioral), unit objectives, reading assignments, formative tests, and summative tests. All of these items were constructed according to the methods outlined by Dr. Jones in the orientation session and the individual consultation sessions. It is beyond the scope and purpose of this report to deal with the mechanics of constructing the materials. Such information is available with the Director or the consultant, Dr. Jones.

Each time that Dr. Jones came to the campus during the academic year, he spent anywhere from 15 to 45 minutes reviewing prepared materials and making suggestions for each of the Mastery faculty. Each full-time faculty member arrived for consultation at an appointed time between 9:00 A.M and 2:00 P.M. The Director was present during 90 percent of these conferences; this always took precedence over any other activities. He felt that it was crucial to demonstrate support, know exactly what Dr. Jones suggested to each member, and discuss each evaluation with Dr. Jones. The Director was convinced from the outset that the Mastery Learning Program held the highest priority among all of the activities in which he was involved as Dean. During the period in which he drove Dr. Jones to the airport, he and Dr. Jones discussed the progress of the Program. Dr. Jones visited the campus about eight times during the first year and twice in the second year.

The faculty members were involved in spending two-four hours out of class each week developing the course materials which would be ready in final, typed form for classroom use at the end of the second quarter of the first year, 1978-1979. At each visit Dr. Jones indicated that he felt that the progress toward this goal was on schedule. Finally in March 1979, Dr. Jones gave final approval to the packages which were ready for classroom use. He suggested that before the term commenced the Director should assemble the entire student body and introduce them to the new strategy upon which many of them were about to embark. The Director did that a few days before the spring term commenced.

Dr. Jones returned twice in the last term, 1978-1979, once to evaluate progress in the classroom, and secondly to conduct the end-of-year evaluation. Dr. Jones' findings and conclusions have already been discussed, and a copy of his evaluation is contained in the appendix.

The Director has provided the foregoing narrative-discussion of the 16 months of the Program as a means for revealing in a chronological context how the Program developed, how problems developed or were avoided, and how those that developed were handled.

The Director attributes the fact that few problems developed in the course of 16 months to careful planning, the very frequent visits of the consultant, and the evaluation-incentive system.

It is now appropriate to summarize briefly the overall achievements and shortcomings of the Program in its 16 months.

Achievements

1. A faculty development program, heretofore lacking, which provided workshops, private consultation, and monetary incentives for additional output.

2. Changed attitudes and higher morale on the part of the faculty. Greater enthusiasm for teaching.

3. Increased academic self-esteem, self-confidence, and enthusiasm on the part of students. Approximately 300 students were served by the Program in the 16 months.

4. Higher levels of academic performance (relative to Control and earlier students as demonstrated on formative and summative tests and in final grades).

5. Augmented level of professional morale on the part of administrators.

6. Dissemination of information on the techniques, materials, and the results of Mastery Learning at Durham College to junior and senior college educators. Increased awareness of alternative strategies among educators in North Carolina and at least three institutions outside of North Carolina, one each in Virginia, Maryland, and California.

Shortcomings

1. Failure to provide conclusive statistical evidence of the superiority of Mastery Learning over traditional techniques at Durham College (because of the brevity of the Program).

2. Failure to complete Mastery packages for all of the courses regularly taught at Durham College.

3. Failure to involve all full-time students at Durham College in some phase of the Mastery Program.

Discussion of Shortcomings

Because of the brevity of the Program curtailed by a financial crisis and the closing of the school, only one set of data out of a potential of seven sets is available for analysis. Although the initial results were positive and encouraging, they are hardly sufficient in a rigorous scientific sense for a definitive empirical evaluation of the effects of Mastery Learning at Durham College. Dr. Jones indicated that "although the data does not demonstrate marked superiority in the effectiveness of the Mastery Learning strategy over the traditional strategy in the seven academic areas cited, there has been an overall improvement in instruction within Durham College." The small enrollment in the classes made it difficult to attach statistical significance to the data. Even so, 78 percent of the Mastery students achieved final grades of "A" or "B" as compared with 75 percent of the Control students. Dr. Jones noted that the small Control classes allowed for a great deal of individualized instruction and that therefore the cognitive

achievement seen there would be very difficult to improve upon, even using tutors on a one-to-one student-teacher relationship. It is important to keep in mind that the results presented here represent the first attempt at implementing the Mastery strategy on the part of the faculty of Durham College. Dr. Jones indicated that the Mastery experience at the City Colleges of Chicago demonstrated that more experienced instructors produce better results than do those who are using the strategy for the first time.

The Director is convinced that had the program continued for its intended length instructional packages would have been completed for all the courses regularly taught at Durham College. Then as new courses would have been developed, corresponding materials would have been added. The cumulative goal for the second year was the development of 18 sets, at the end of the Program in December, ten sets or 56 percent of that goal had been achieved. Progress was moving according to schedule.

If the Program had continued, by the end of the second year, approximately 75 percent of the enrollment would have been involved in Mastery instruction; at the time of closing approximately 30 percent of the enrollment were receiving the benefits of Mastery instruction. By the end of the third year, the Director feels that 100 percent of the enrollment would have benefited from some phase of the Program.

Dissemination of Documents and Information

Because of the project's short duration, the documents produced are relatively few: initial proposal, six-months' report, 1979, consultant's evaluation, 1979, end-of-year report, 1979, and the Mastery course materials. Because of the closing of the College, dissemination from the College may be difficult; requests for information or copies of materials should be made to the Director, Dr. Donald R. Wire, or to the President, Dr. J.W. Hill. Those requesting information should be prepared to pay the cost of reproduction. Following are the addresses of Dr. Wire and Dr. Hill: Dr. Donald R. Wire, 540 Nottingham Drive, Fayetteville, North Carolina 28301, 919 488-6624; Dr. J. W. Hill, Durham College, 3128 Fayetteville Street, Durham, North Carolina 27707, 919 688-8813.

The Director feels that the proposal and the end-of-year evaluation and report are of value to junior and senior college administrators who are reviewing alternative learning strategies for adoption at institutions which serve disadvantaged learners. The same documents together with the raw data sheets from each section should be of interest to educational researchers. Faculty members at junior and senior institutions would be interested in examining copies of select course materials and related performance data sheets. The Director believes that the expanding awareness of educators with respect to learning strategies for the disadvantaged will manifest an increasing demand for such materials in the future.

Budgets and Funds

The following discussion reveals the budgeting of funds and their expenditures during the 16-month duration of the Program. The Director has attempted to provide insight into the reasons for budget revisions and the manner in which the funds were actually expended. This should provide interested educators with an

understanding of some of the problems involved in allocating funds for a Mastery Learning Program. Some of the budget items which were initially stressed as demanding areas actually proved to be much less demanding such as travel, equipment, and production.

First Year

After the budget for the first year was worked out and approved in the summer of 1978, the Director found it appropriate to request revisions in the allocation of funds for various items. Following is a comparison of the initial budget, the revised budget, and the actual expenditures for the first year of the Program.

	INITIAL	REVISED	EXPENDITURES
Direct Costs			
Salaries and Wages			
Professional	8,400	6,496	5,984
Consultant	972	2,277.96	2,809
Clerical	5,100	5,100	5,100
Employee Benefits	2,025	2,025	2,083.95
Travel	2,825	2,825	
Materials and Supplies	6,000	8,523.04	3,324.24
Equipment	1,875	1,875	
Production	3,000	3,000	191.74
Other	5,800	3,875	
Indirect Costs	2,700	2,700	15,149.05
Total	38,697	38,697	34,641.98

Included in the professional salary expenditures were the Director's salary of $4800 and the $32 monthly incentives which faculty members earned. Although three consultation visits were planned for annually, the Director deemed it necessary and appropriate to schedule eight visits for the first year. Travel expense did not materialize because the Chicago workshop for Mastery faculty had to be cancelled because of conflicting summer schedules. There was no equipment expenditure because the Director was still in the process of assessing the need for various types of reproduction equipment and inspecting their capabilities. Production (printing) expenses were not as great as anticipated because most of the professional and instructional materials were run on stencils rather than printed because of the immediate need for them. "Other" expenditures were to have paid for the Chicago workshop expenses, other than travel, for faculty members. A much larger portion of the budget than was anticipated was absorbed by indirect costs.

In reviewing the expenditures for the first year, the Director with hindsight feels that a much larger portion of the budget (actual amount was $1184) could have been devoted to faculty incentives. It is difficult to estimate how much more faculty motivation would have been generated by larger incentives such as $50-$100 per month in comparison with that produced by the $32 per month; however, the Director feels that it would have been cost-effective.

The Director feels that the unobligated balance of $4,055.02 should have been expended on "Materials and Supplies", but a temporary freezing of funds for approximately two months interfered with the use of the remaining budget.

The Program cost per student for the first year was about $301 for 115 students.

Second Year

After the budget for the second year was worked out and approved in the summer of 1978, the Director deemed it appropriate, based on the first year's experiences, to request a revision in the allocation of funds for various items. Following is a comparison of the initial budget, the revised budget, and the actual expenditures for the final four months of the Program.

	INITIAL	REVISED	EXPENDITURES
Direct Costs			
Salaries and Wages			
Professional	8,400	7,480	2,762.25
Consultant	605	800	1,035.18
Clerical	5,100	5,100	
Employee Benefits	2,025	1,887	
Travel	2,825	1,254	318.33
Materials and Supplies	5,000	6,000	800.85
Equipment	575	2,000	
Production	2,500	4,064	694.78
Other	1,800	245	
Indirect Costs	5,168	5,168	1,291.98
Total	33,998	33,998	6,903.37

Although the first semester 1979-1980 didn't officially end until December 14,1979, all federal funds were frozen in bank accounts during the second week of December. This meant that the Mastery Program funds were available only during the first three

months of the fiscal period of the second year, and it explains the small expenditures as shown above. The funds were never freed.

If the Mastery funds had remained available and Durham College had continued its operation through the fiscal year, consultant expenditures would likely have doubled because three more visits by Dr. Jones were planned. It appears that approximately $300 per month was being expended for "Materials and Supplies" rather than the anticipated $500. The balance of the "Materials and Supplies" budget would have been expended on the purchase of textbooks and other instructional materials for the Mastery sections during the remainder of the year. Additional reproduction equipment would have been purchased at an expenditure of $2000. Production expenses would likely have doubled. Monthly incentive payments were increased from $32 to $40 for the second year. The Director would have increased these to $50 if the Program had continued.

During the four months of the second year, the cost of the Program per student was about $12 per month per Mastery student for the 150 students being served.

Dr. Donald R. Wire, Academic Dean
Program Director

Dr. J.W. Hill, President
Authorizing Official

A P P E N D I X

May 25, 1979

TO WHOM IT MAY CONCERN:

I served as a consultant for the 1978-79 Mastery Learning Project conducted at Durham College. Seven faculty members actively participated in the program; and they represented the following academic areas: business law, psychology, shorthand, fashion buying, English composition, business mathematics and records management.

During the academic year I spent a total of nine days on campus discussing the principles, practices and out-comes of the Mastery Learning strategy as developed by Profes or Benjamin S. Bloom of the University of Chicago.

The following charts show the distribution of final grades achieved by students enrollment in Mastery Learning and control classes.

	Mastery Classes					
		A	B	C	D	E
Number	85	39	27	13	3	3
Percent	100	46	32	15	3	3

	Control Classes					
		A	B	C	D	E
Number	80	33	27	18	1	1
Percent	100	41	34	23	1	1

The control classes are ones taught by the same instructor in the same academic subjects as the mastery classes. The mastery classes include seven different academic areas with an average of only twelve students per class. Because of the low enrollment at the college, there were classes with only one, four and eight students. The control classes represent six different academic areas with an average of thirteen students per class.

Because of limited offerings at the college, all of the control classes except one were taught in quarters previous to the mastery classes; and therefore one does not know for sure if the student characteristics were comparable in both cases. In addition to the statistical limitations imposed, while interpreting the data one must also keep in mind that the results presented here represent the first attempt at implementing the Mastery Learning strategy on the part of the Durham College faculty. Our work at the City College of Chicago indicates that most experienced teachers produce

better results than do teachers using the strategy for the first time.

In spite of the above problems and limitations I feel that the project has been moderately successful. Because of the small sized classes the control students were given a lot of individualized attention; and hence they were exposed to an important factor of any learning strategy. Nevertheless, it appears that more of the average or "C" students of the mastery classes were pushed into the "A-B" range. While the percent of "A-B" students is about the same in both the experimental (mastery) and control groups, the percent of C's is significantly lower in the mastery classes.

Most importantly, the majority of the mastery faculty reported an increased enthusiasm for learning on the part of students.
Repeated successes on the diagnostic-progress tests seemed to have significantly increased the student's academic self-concept with regard to general school ability; and the students also seemed to have become more interested in learning specific subjects.

The experience with the Mastery Learning strategy also produced changes in teacher behavior and attitudes. The teachers no longer think of their fundtion as singling out and certifying qualified students. Most have moved to the idea that the teacher's role is to facilitate learning for all, thereby minimizing disparity in student cognitive achievement.

Durham College is making plans to extent Mastery Learning principles throughout its entire academic area. The students who experienced success with it are asking for additional classes using the approach. I believe that the extended use of the Mastery Strategy will continue to cause overall improvement in instruction at the college; and as the class sizes increase this improvement will become more manifest statistically.

Emmett L. Jones
Professor of Biology
City Colleges of Chicago

SUMMER OF 1979
FUNDAMENTALS OF ENGLISH
MASTERY ACHIEVEMENT
FINAL GRADES

Mastery and Control Sections

SECTION	STUDENTS	NUMBER AND (PERCENTAGE) A	B	C	D	F
Mastery	25	7(23)	11(44)	5(20)	2(8)	0(0)
Control	23	3(13)	5(22)	7(30.5)	7(30.5)	1(4)

Durham College

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